



The *Liothrips*-lineage of thrips (Thysanoptera: Phlaeothripidae) from Iran with the first record of micropterous morph of a *Liothrips* species

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Abstract

A key is provided to the three Phlaeothripinae genera of the *Liothrips*-lineage known from Iran, *Cephalothrips*, *Liothrips*, and *Liophloeothrips*. *Ataliothrips* is placed as a **new synonym** of *Liothrips*, and the micropterous morph of *L. reuteri* described, this morph being unique among species of *Liothrips*. Illustrated keys are provided to the species of these genera recorded from Iran, all of which are considered to be leaf-feeding. In addition, a key is provided to the three species of *Liophloeothrips* from Europe, because *L. hungaricus* has been recorded from Iran although with no known voucher specimens.

Key words: *Ataliothrips*, micropterae, *Liothrips*, new synonymy, *Liophloeothrips*, *Cephalothrips*

Introduction

Worldwide there is a lack of identification systems to the genera and species of the Phlaeothripinae, the larger of the two subfamilies recognised in the family Phlaeothripidae. The only available keys to the Phlaeothripidae fauna of Europe and western Asia were developed more than 50 years ago, and involve nomenclature and a classification that is out of date (Priesner 1964). For the 20 recorded genera comprising the Phlaeothripidae fauna of Iran (Minaei 2013b), keys are available to the taxa of subfamily Idolothripinae (Minaei 2011), and also to two of the three major lineages within the Phlaeothripinae, the Haplothripini (Minaei & Mound 2008) and the *Phlaeothrips*-lineage (Minaei 2013a). The objective of the study presented here is to provide a means of identifying the members reported from Iran of the third major group within the Phlaeothripinae, the *Liothrips*-lineage. This group is particularly diverse and species-rich in tropical areas, and Dang *et al.* (2014) provided keys to 100 genera of Phlaeothripinae recorded from southeastern Asia including 34 genera related to *Liothrips*. The species in these genera are all leaf-feeding, and many of them are gall-inducing or are associated with galls.

Within the Thysanoptera there are only four genera in each of which more than 200 species are listed (ThripsWiki 2014). These genera are *Frankliniella* and *Thrips* in the Thripidae, with 230 and 289 species respectively, and *Haplothrips* and *Liothrips* in the Phlaeothripidae with 242 and 277 species. The recognition and delineation of species, and hence recognition of host plant associations, involves far greater problems in the genera *Frankliniella* and *Liothrips* than in the genera *Thrips* and *Haplothrips*. Not only are the structural differences between many described species poorly defined, but in both *Frankliniella* and *Liothrips* many named species remain known from single samples, or even single individuals. There is thus little knowledge of structural variation within and between species (Okajima 2006; Hoddle *et al.* 2014), and limited evidence for any host-specificity in the breeding relationships of most species (Mound & Pereyra 2008; Cavaleri & Mound 2012). Even in common European species, such as *Liothrips setinodis* discussed below, misidentifications and host records based only on one or a few adults result in there being little reliable evidence concerning the plant species on which a thrips is dependent for survival (Mound 2013).

Acknowledgements, depositories and abbreviations

Ms. Fatemeh Kazemi (Pistachio Research Institute, Rafsanjan, Kerman Province) kindly provides us the materials of *Liothrips austriacus*. We are grateful to Prof. Gerald Moritz, University of Halle-Wittenberg, to Dr Patricia Nel of the Muséum National d'Histoire Naturelle, Paris (MNHN), and to Sverre Kobro, Plant Health and Plant Protection Division, Norway, for providing specimens for study. Andrea Hastenpflug-Vesmanis at the Senckenberg Museum, Frankfurt (SMF), and Paul Brown at the Natural History Museum, London (BMNH), kindly provided many specimens on loan. Jalil Alavi (Agricultural and Natural Resources Research Center of Khorasan-e Shomali, Bojnourd, Iran) loaned us a specimen of *Cephalothrips monilicornis*. The authors are particularly grateful to Adriano Cavalleri and three anonymous referees who provided us with criticisms and corrections to an earlier draft. The thrips specimens listed in this paper are deposited in Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz (PPSU), with a few in the Australian National Insect Collection, Canberra (ANIC). The following abbreviations are used for pronotal setae: am—anteromarginals; aa—anteroangulars; ml—midlaterals; epim—epimerals; pa—posteroangulars.

The target group: *Liothrips* lineage

Leaf-feeding species of the Phlaeothripidae-Phlaeothripinae: Antennae usually 8-segmented, usually with one sense cone on segment III and three on IV. Head often longer than broad, usually with a pair of postocular setae; eyes and ocelli present; maxillary bridge usually not developed. Pronotum usually with 5 pairs of major setae, notopleural sutures complete. Basantra absent; ferna and prospinasternum well developed; metathoracic sternopleural sutures present. Legs usually long and slender. Fore wings parallel-sided, with duplicated cilia. Pelta usually triangular; abdominal terga II–VII each with two pairs of sigmoid wing-retaining setae; tube usually straight-sided, usually shorter than head. Male sternite VIII usually with an entire pore plate.

Key to genera of *Liothrips*-lineage from Iran

1. Fore tarsus inner margin in both sexes without tooth; antennal segment IV with 3 sense cones; tergite IX setae S1 and S2 with apices pointed *Liothrips*
- . Fore tarsus inner margin with tooth in both sexes (Fig. 12); antennal segment IV with 2 or 3 sense cones; tergite IX setae S1 and S2 with apices weakly to broadly capitate (Fig. 13) 2
2. Mouth cone short and rounded; apterous, rarely macropterous with fore wings lacking duplicated cilia; antennal segment IV with 2 sense cones *Cephalothrips*
- . Mouth cone pointed, extending to mesosternum; usually macropterous, fore wings with duplicated cilia; antennal segment IV with 2 or 3 sense cones *Liophloeothrips*

Cephalothrips Uzel

Cephalothrips Uzel, 1895: 244. Type species *Phloeothrips monilicornis* Reuter 1885, by monotypy.

There are eight species listed in this genus from around the world (ThripsWiki 2014), but the relationships of the genus remain equivocal. Although listed by Dang *et al.* (2014) in the *Phlaeothrips* lineage, primarily because of the presence of only two sense cones on the fourth antennal segment, the genus can equally well be considered a member of the *Liothrips*-lineage that exhibits extreme wing-reduction and in which one sense cone has also been lost. The diagnostic characters of the genus are as follows: usually apterous; head longer than wide with short postocular setae; antennal segment III with 1 sense cone, IV with 2, VI broadly truncate at apex; pronotum with setae am, aa and ml minute, epim and pa short; prosternal basantra absent; mesopresternum reduced to lateral triangles; sternopleural sutures present; fore tarsi with small tooth; tergites II–VII without sigmoid wing-retaining setae; tergite IX setae S1 and S2 short; tube shorter than head, anal setae shorter than tube; macropterae uncommon and lacking fore wing duplicated cilia.

Key to species from Iran

1. Compound eyes prolonged ventrally beyond the posterior dorsal margin (Fig. 10); body mostly brown *monilicornis*
- Compound eyes not prolonged ventrally beyond the posterior dorsal margin (Fig. 9); body bicoloured *coxalis*

Cephalothrips coxalis Bagnall

Cephalothrips coxalis Bagnall, 1926: 657.

Alavi and Kamali (2002) recorded the species for the first time from Iran without information on the plant from which the species was collected. However, subsequently, Alavi and Kamali (2003) provided the following details: one female from leaves of *Berberis* sp. and one female from leaves of *Pyrus* sp. In this study both sexes of the species were collected on leaves of mulberry, but it remains unclear if this species is leaf-feeding or fungus-feeding. There are specimens of *coxalis* in the collections of the SMF from the following areas: Germany, Greece, Italy, Sicily, France, Spain, Dalmatia, Turkey, Sinai and Morocco.

Material studied. IRAN, Fars Province, Shiraz, Badjgah, 4 females, 2 males from leaves of *Morus albus*, 13.iv.1998 (KM, no code); 2 females, same place and plant, no dates (KM, no code).

Cephalothrips monilicornis (Reuter)

Phloeothrips monilicornis Reuter, 1885: 21.

Alavi and Kamali (1995) recorded the species for the first time from Iran without information on the plants from which the species was collected. Subsequently, Alavi and Kamali (2003) provided the following details: two females from flowering *Carum carvi* (Apiaceae), and (Alavi *et al.* 2007) recorded the species from barley in Gorgan. This is a widespread Holarctic species, and in the collections of SMF there are specimens from the following areas: Norway, Sweden, England, France, Germany, Austria, Italy, Spain, Hungary, Moravia, Slovakia, Slovenia, Greece, Istria, Georgia, Mongolia, Canada, USA (Wisconsin).

Material studied. IRAN, Golestan Province, Gorgan, Chahar-bagh, 1 female, from barley, 6.v.1998 (Jalil Alavi).

Liophloeothrips Priesner

Liophloeothrips Priesner, 1919: 138. Type species *Liophloeothrips glaber* Priesner, 1919, by monotypy.

There are 16 species listed in *Liophloeothrips* (ThripsWiki 2014), of which all but three are from India, and a key to those 13 is provided by Tyagi and Kumar (2011). The 13 species from India are all considered to be leaf-feeding, but the biology of the remaining three species, all from Europe, is unknown. *L. glaber* is known from a single male taken in Albania (in SMF), although one female (in BMNH) is here identified as this species and bears the following data "Crimea, Alushta, viii.1927, *Quercus*, Oscar John Coll.". Kobro (2011) lists *glaber* from Finland, but the only available specimen from that country, labeled as *glaber* by zur Strassen, is a teneral female macroptera. This specimen is too weakly pigmented to be certain of its identity, but it probably represents the previously unknown macropterous form of *hungaricus*. The latter species was described from Hungary, is known from Finland, and an unsubstantiated record from Iran is mentioned below. The third species, *pulchrisetis* Bournier, is known only from a single female from France (Bournier 1969). Dyadechko (1977: 268) lists *Liophloeothrips* as a synonym of *Rhynchothrips* Hood, and also records both *glaber* and *hungaricus* from USSR, but it is not possible to substantiate these records.

Key to *Liophloeothrips* species from Europe

1. Antennal segment III almost 2.0 times as long as wide; fore tibiae yellow except at base [post ocular setae capitate, shorter than eye; pronotal mid lateral setae arising close to notopleural suture; metanotum with median setae small, acute, also 1 pair of small discal setae on anterior third; tergite IX setae S1 and S2 capitate and half as long as tube, S3 acute and as long as tube; sternite VIII of male largely occupied by pore plate] *glaber*
- Antennal segment III less than 1.7 times as long as wide; fore tibiae extensively brown 2
2. Mouth cone extending to mesosternum; fore tibiae yellow only at apex; antennal segments V and VI variable, from uniformly brown to yellow at base (Fig. 11); [sternite VIII of male without a pore plate] *hungaricus*
- Mouth cone longer, extending between mesothoracic legs; fore tibiae yellow on apical third; antennal segments V and VI uniformly brown; [male unknown] *pulchrisetis*

Liophloeothrips hungaricus (Priesner)

Rhynchothrips hungaricus Priesner, 1924: 52.

The following specimens, all apterae, have been studied: **Hungary**, Simontornya, from *Salix*: 4 males, 3 female syntypes, 13.xii.1923 (F. Pillich) (in SMF), 1 female, 2.xii.1924 (in BMNH), 1 male, 16.iii.1924, 2 females, 2.iii.1926 (in SMF); **Moravia**, Brno, 1 female 1 male, 15.x.1950 (MNHN), 1 female from *Salix*, 12.x.1947 (in Moritz coll.); **Finland**, Jappila, 1 female, 1 male in trap on aspen, vi–viii.2001 (in Kobro coll.).

Judging from the labels on these slides, this species is associated with the bark of certain Salicaceae, including *Salix* and *Populus*. In both sexes, tergite IX setae S1 and S2 are not much longer than the width of the base of the tube (Fig. 13), with capitate apices, whereas setae S3 are finely acute and longer than the tube. The fore tarsal tooth is variable in females, ranging from less than one third as long as the width of the fore tarsus (Fig. 12) to about half that width, and sternite VIII of the male lacks a pore plate. The number of sense cones on antennal segment IV varies amongst the available specimens, with either one large or two smaller sense cones on the outer margin. Moreover, in two specimens the left and right antennae differ from each other. The unique apterous female holotype of *pulchrisetis* has been studied (MNHN). Despite the differences noted in the key above, this specimen possibly represents a local variant of *hungaricus*. Moreover, even the distinction given above between *glaber* and *hungaricus*, being based on so few specimens, cannot be considered as entirely secure. Mortazawiha (1995) reported *hungaricus* from Iran, together with 14 other species of Thysanoptera, but without any information concerning the locality, date of collection, or number of specimens. The text of that report suggests that zur Strassen may have studied the specimens, but there is no evidence in the collections at SMF to support this.

Liothrips Uzel

Liothrips Uzel, 1895: 261. Type species *Phloeothrips setinodis* Reuter.

Ataliothrips Bhatti, 1995: 98. Type species *Compsothrips reuteri* Bagnall. **syn.n.**

Bhatti (1995) proposed *Ataliothrips* as a monobasic genus, and distinguished it from *Liothrips* with the following words: "the presence of rudimentary postocular setae and by the metanotal sculpture with somewhat enlarged midlateral reticulations as if pinching the midpoint sculpture made of closer lines". Certainly, no other species of *Liothrips* has such small postocular setae, often scarcely longer than the minor setae on the vertex. However, the length of this pair of setae is variable in *reuteri*, with one or both setae sometimes extending to the posterior margin of the compound eye (Figs 14–16). Moreover, within other genera of Phlaeothripinae, particularly *Haplothrips*, the length of the postocular setae varies between species. For example, *H. leucanthemi* in Europe and *H. timori* in Australia both have the postocular setae very short in contrast to most species in this genus (Mound & Minaei 2007; Minaei & Mound 2008). Moreover, an analysis of variation among six populations of *Haplothrips tritici* in Iran demonstrated that the length of these setae varies both within and between populations (Minaei & Mound 2010). Thus the short postocular setae of *reuteri* can be considered as no more than an unusual autapomorphy of a single species within the genus *Liothrips*.

The metanotal sculpture is an even less convincing character state on which to distinguish *Ataliothrips* as a

separate genus. This sculpture varies in *reuteri* between macropterous and micropterous females (Figs 20–21), and moreover is not essentially different from that of either *Liothrips austriacus* or *L. pragensis* (Figs 18–19). The genus *Ataliothrips* is therefore here considered a synonym of *Liothrips*.

Almost all *Liothrips* species feed on green leaves, and some tropical species induce leaf-galls. Despite this, few species in the genus are considered pests, although *L. vaneekii* is a widespread pest on cultivated lily bulbs and orchid stems (Mound & Kibby 1998), and *L. adisi* was described as a pest of Guarana trees (*Paullinia cupana*) in Brazil (zur Strassen 1978). Moreover, *L. austriacus* is discussed below as having been reported as a pest of cultivated *Pistacia* trees in Iran. In contrast, a few species have been involved in weed biological control around the world (Simmonds 1933; Cock 1982; Liao *et al.* 1991, 1994; Mound & Pereyra 2008).

From Iran, four *Liothrips* species have been reported, but one of these, *L. jakhontovi*, is currently considered a synonym of *L. setinodis* (see Bhatti *et al.* 2009). The following key distinguishes the three remaining species together with *L. reuteri*.

Key to species of *Liothrips* from Iran

1. Postocular setae usually no longer than minor setae on head, rarely extending to posterior margin of eye (Figs 14–16); mid and hind tibiae and tarsi uniformly dark (Fig. 6); macropterous or micropterous [on *Tamarix*] *reuteri*
- . Postocular setae long, extending beyond posterior margin of eye (Fig. 17); mid and hind tarsi yellow, at least apex of tibiae yellow; always macropterous. 2
2. All tibiae clear yellow (Fig. 5); antennal segment II mostly yellow (Fig. 2) [on leaves of *Quercus* spp.] *pragensis*
- . Mid and hind tibiae brown with apex yellow (Fig. 4); antennal segment II brown 3
3. Tergite IX setae S1 less than 0.7 as long as tube; mid and hind tibiae yellow on distal eighth; antennal segment VII brown *setinodis*
- . Tergite IX setae S1 more than 0.8 as long as tube; mid and hind tibiae yellow on distal third (Fig. 4); antennal segment VII yellow (Fig. 1) *austriacus*

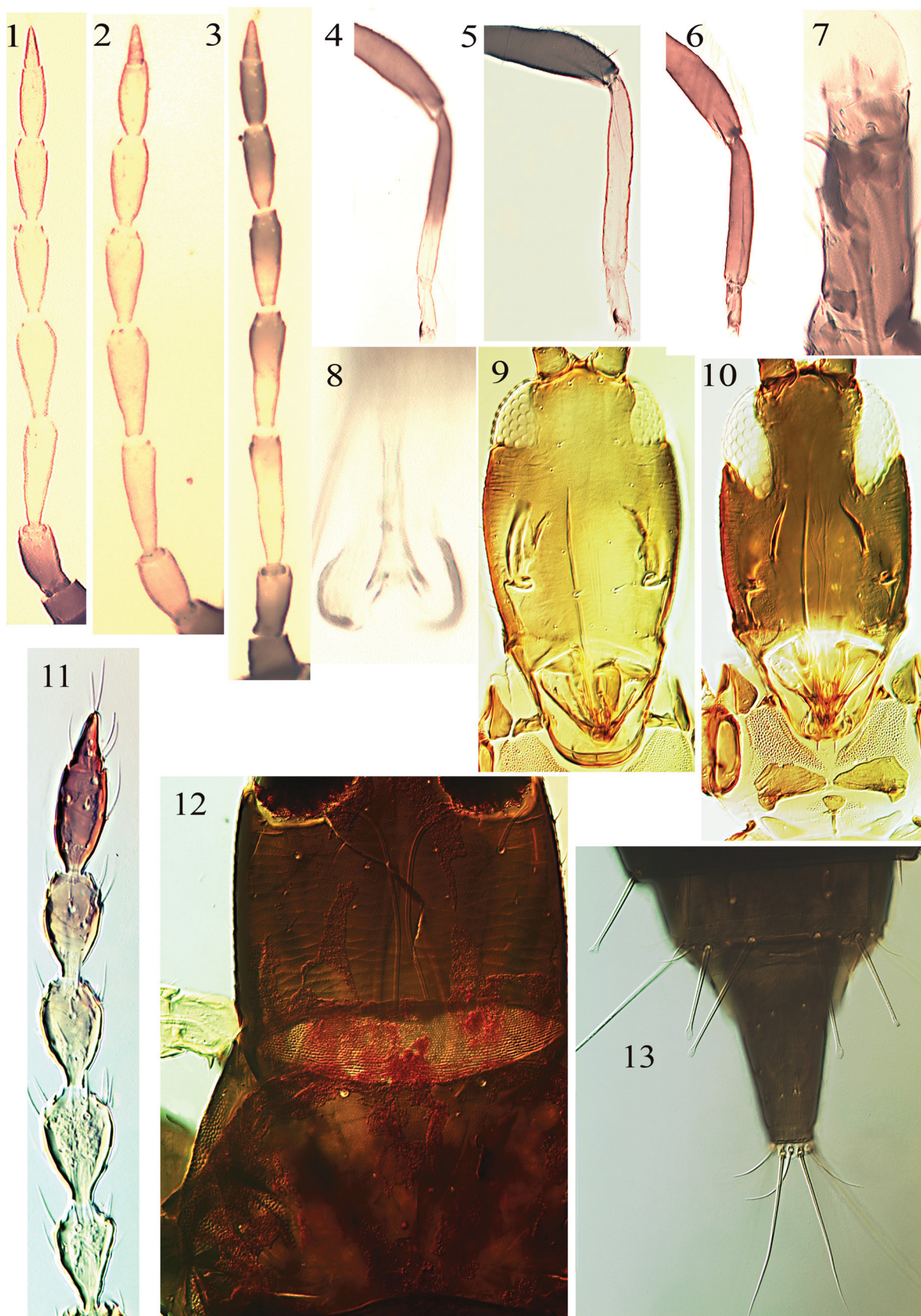
Liothrips austriacus (Karny)

Hoodia austriaca Karny, 1910: 43.

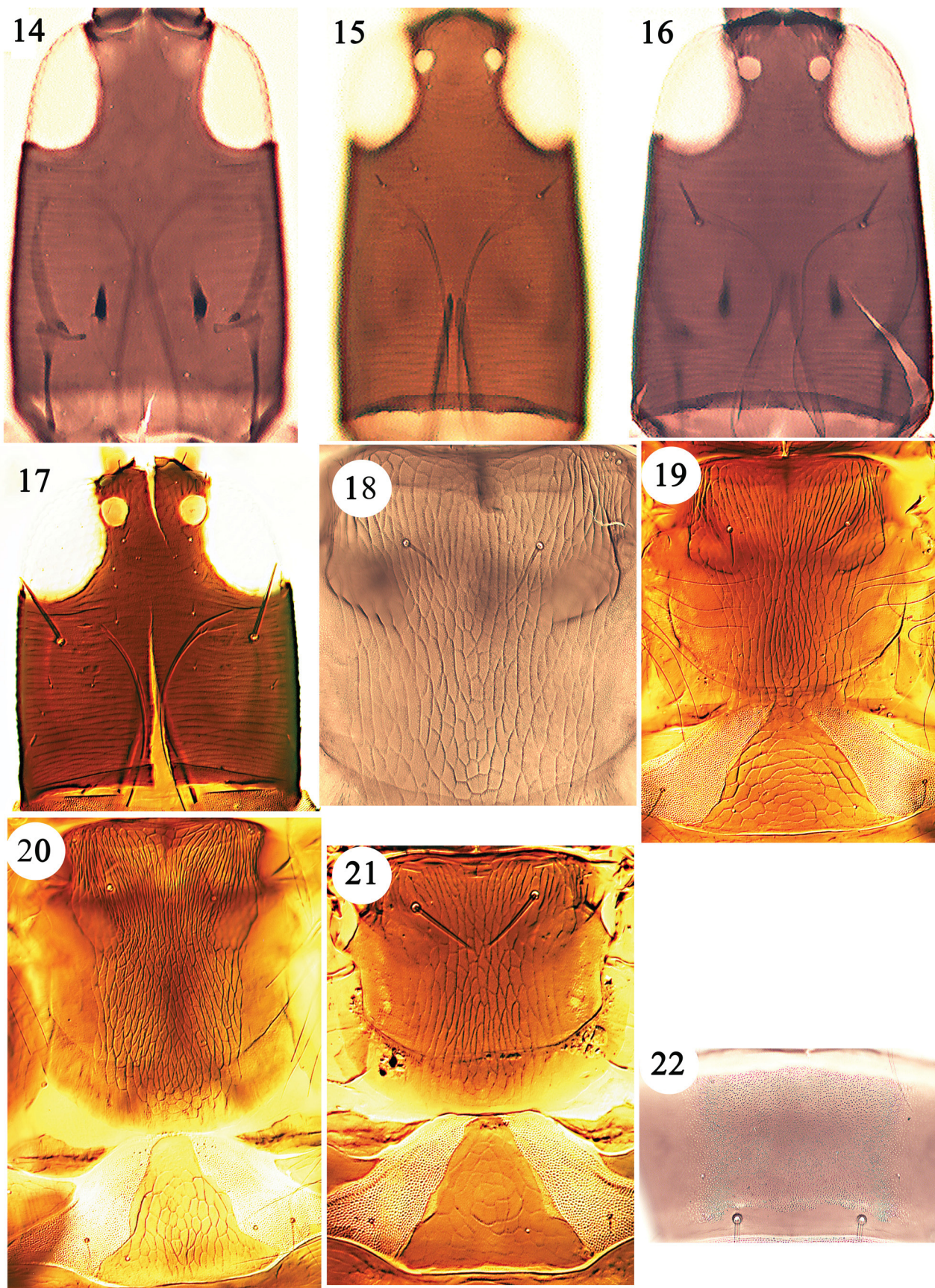
Recorded by Priesner (1964) as widespread in Central and Southern Europe with larvae on *Ulmus glabra*, this species is recorded from Turkey by Tunc *et al.* (2012) on Pistachio, and a few specimens are listed below from *Pistacia vera* in Iran, Kerman Province. Hasani and Fallahzadeh (2005) reported one adult collected on the leaves of *Pistachia atlantica* from Kerman Province. Mehrnejad and Panahi (2006) found *austriacus* infesting pistachio fruits with ruptured hulls, either at pre-maturation (early splits) or later (mature fruits with cracked hulls), and they recorded that this thrips infests up to 75% of pistachio nuts but subsequently has been the subject of other studies by Mehrnejad and Panahi (2006) and Kazemi and Mehrnejad (2011). According to Kazemi and Mehrnejad (2011), feeding by this thrips causes brown spots on the hull of fruit, and injured fruits become dry with irregular cracks in the pericarp. They examined these thrips-damaged fruits for aflatoxin contamination.

In structure *austriacus* is closely similar to *setinodis*, although that usually has the metanotum with weaker sculpture. These two species have possibly been confused in published literature, but they can be distinguished by means of the character states in the key above. In the collections at SMF there are specimens of *austriacus* from the following areas: Austria, Germany, Hungary, Croatia, Slovenia, Sweden, Spain, Turkey and Iran.

Material studied. **IRAN, Kerman Province**, Rafsenjan, from *Pistacia vera*: 4 females 1 male, vi.2003 (Reza Hasani), 3 females, 2 males, ix.2005 (Mehrnejad), in SMF; from the same host and locality, 2 females, 30.vi.2008 (F. Kazemi), 1 female, 16.viii.2008 (G.Kashkoli) (in ANIC); from the same host and locality, 5 females, 4 males, 22.iv.2008, 8 females, 1 male, 30.vi.2008 (F. Kazemi), 3 females, 1 male, 16.viii.2008 (G. Kashkoli), 5 females, 30.viii.2010 (G. Kashkoli); **Fars Province**, Shiraz, Dinakan, from *Pistacia atlantica*: 2 females, 2 males, 4.vii.2014 (KM 1216) (in PPSU).



FIGURES 1–13. *Liothrips* from Iran. Antenna, 1–3: (1) *austriacus*; (2) *pragensis*; (3) *reuteri*. Hind leg, 4–6: (4) *austriacus*; (5) *pragensis*; (6) *reuteri*. (7) Fore tarsus, *reuteri* macroptera. (8) Male genitalia, *pragensis*. *Cephalothrips* from Iran. Head: (9) *coxalis*; (10) *monilicornis*. *Liophloeothrips hungaricus* syntype male, 11–13: (11) Antenna; (12) Fore tarsal tooth; (13) Tergite IX and tube.



FIGURES 14–22. *Liothrips* from Iran. (14–16) Variation in length of *reuteri* postocular setae. (17) Head, *pragensis*. (18) Metanotum, *austriacus*. Metanotum and pelta 19–21: (19) *pragensis*; (20) *reuteri*, macroptera; (21) *reuteri*, microptera. (22) Abdominal sternite VIII, *austriacus*.

Liothrips pragensis Uzel

Liothrips pragensis Uzel, 1895: 263

This species is distributed from southern Europe (including Germany, Hungary, Greece, Turkey and Cyprus) to Central Asia, and is usually collected from leaves of various species of *Quercus* (Priesner 1964). In Iran, Fars Province, it was recorded from *Amygdalus scoparia*, *Phlomis* sp. and *Quercus brantii* (Minaei & Asadi 2004). However, more recent collecting from these plants has revealed that the report from first two is not correct, and the species was collected consistently in Fars Province from *Quercus brantii* during spring and summer with a single male from *Ficus carica*.

The colour of the legs (Fig. 5) and second antennal segment (Fig. 2) is distinctive in this species, but the structure of the body and metanotal sculpture (Fig. 19) is similar to that of *austriacus* (Fig. 18).

Material studied. IRAN, Fars Province, Dasht- arzhan, 2 females, from leaves of *Quercus brantii*, 23.iv.1999 (KM, no code); Nurabad, Shirespari village, 1 male from leaves of *Ficus carica*, 31.iii.2008 (KM 32); Nurabad, Harariz village, 2 females, 3 males from leaves of *Quercus brantii*, 1.iv.2008 (KM 36) [1 female with this data in ANIC]; Kazerun, 7 females, 8 males from leaves of *Quercus brantii*, 17.vi.2008 (KM 146); Nurabad, Kolah Siah, 1 male from leaves of *Quercus brantii*, 30.vii.2014.

Liothrips reuteri (Bagnall)

Compsothrips reuteri Bagnall, 1913: 295.

Ataliothrips reuteri (Bagnall) Bhatti, 1995.

Described originally from one female collected in Suez, Egypt, without any plant record. Priesner (1964) gave the distribution of this species as North Africa and India living on tamarisk. According to zur Strassen and Harten (2008), the species occurs in Canary Islands, Mediterranean, United Arab Emirates, Iran, India, Mongolia, Niger, and Sudan. Mortazawiha and Dern (1977) reported a few specimens of this species from *Tamarix* sp. in Iran, at Bam, Kerman Province, and subsequently Barkhordari *et al.* (1981), also Kheyrandish Koshkoei (2000), collected it on the same plant in Kerman Province.

As indicated below under material studied, macropterae of *reuteri* have been collected in three Provinces of Iran. Moreover, micropterae were collected on tamarisk at Shiraz during spring, but subsequent collecting in summer yielded macropterae on the same plant. It is possible that production of the two morphs in *L. reuteri* on this tamarisk bush was controlled environmentally, with the higher population density in spring being micropterae but macropterae being produced during summer. Similarly, Nakao (1999) demonstrated that *Thrips nigropilosus* Uzel produces short-winged individuals under higher density under laboratory conditions.

Populations of *reuteri* appear to be strictly associated with *Tamarix*, and this thrips is widespread in southern and central Iran. Individuals vary in several character states. For example, the tarsi bear apically a stout or a minute recurved hamus-like structure that is sometimes present on all legs but sometimes found on only one or two legs. This hamus-like appendage usually occurs in macropterae (Fig. 7), but has also been seen on one micropterous individual.

Diagnosis. Macropterous or micropterous. Body colour dark brown, antennal segments variable, I–II dark (sometimes II pale distally), III–IV yellow (sometimes yellow-brown), V–VI yellow basally but variably darker in distal half (rarely III–VI yellow basally but variably darker in distal half), VII–VIII dark (Fig. 3); fore wings clear; major body setae dark brown, setae on tergite VIII paler, tergite IX setae yellowish. Head longer than wide, first ocellus directed forwards; major postocular setae short, variable in length (Figs 14–16), with blunt or pointed apices, maxillary stylets retracted to postocular setae, less than one-fifth of head width apart; mouth cone large, rounded but not extending beyond midpoint of prosternum. Antennae 8-segmented, III longer than IV, III with 1 sense cone, IV with 3; VIII not constricted at base.

Pronotum weakly sculptured, with 5 pairs of major setae: am, aa, ml, epim, and pa, all with apices broadly blunt or capitate with white head; notopleural sutures complete, rarely incomplete; fore tarsi usually without tooth, sometimes with stout or short recurved ventral hamus (Fig. 7) which rarely is also present on mid and/or hind legs; mesopresternum complete; sternopleural sutures short. Metanotum reticulate medially; median setae stout. Fore wing parallel-sided with 7–13 duplicated cilia; sub-basal setae stout with capitate apices.

Pelta broadly triangular, reticulate, campaniform sensilla near postero-lateral angles (Figs 20–21); tergites II–VII each with 2 pairs of sigmoid wing-retaining setae; tergites I–VIII S1 seta capitate to blunt, more pointed toward posterior, tergite IX setae S1 and S2 about as long as tube; tube shorter than head.

Measurements (female macroptera/microptera in microns). Body length 3000/2522. Head, length 390/305; maximum width 260/210, po setae 21/20. Pronotum, length 154/142; median width 387/360; epim, 81/72. Fore wing length 1073/100; sub-basal setae 69/50, 83/63, 86/65. Pelta length 125/107, maximum width 150/155, tergite IX setae S1 120. Tube length 186/140; basal width 80/77; anal setae 145/110. Antennal segments I–VIII length 50/43, 62/53, 120/105, 104/88, 85/75, 74/70, 56/52, 38/31.

Male macroptera or microptera, smaller and usually paler; tergite IX setae S2 short and stout; sternite VIII with an extensive pore plate (cf. Fig. 22). Pseudovirga with two expanded lobes at the end and very similar to the pseudovirga of *austriacus* and *pragensis* (Fig. 8).

Measurements (male macroptera/microptera in microns). Body length 1950/1745. Head, length 288/260; maximum width 203/175. Pronotum, length 115/95; median width 293/288; epim, 80/67. Fore wing length 817/90; sub-basal setae 61/45, 65/48, 70/?. Pelta length 96, maximum width 124, tergite IX setae S1 143/120. Tube length 168/145; basal width 62/60; anal setae 113/75. Antennal segments I–VIII length 34/24, 55/43, 92/69, 78/77, 74/63, 65/60, 54/50, 34/30.

Material studied (macropterae except where stated). **IRAN, Hormozgan Province**, Bandarabas, Mazra village, 4 females, from leaves of *Tamarix* sp., 20.ix.2011; 1 female, 3 males, the same place and plant, 9.xi.2011; 2 females, the same place and plant, 8.xii.2011 (all collected by Mohsen Amiri). **Isfahan Province**, Isfahan, 2 females, 3 males, from leaves of *Tamarix* sp., 5.vii.2012 (Farinaz Haftbaradarn). **Fars Province**, Shiraz, 2 females (micropterae), from leaves of *Tamarix* sp., 21.iv.2012 (KM 753); 4 females, 1 male (microptera), the same place and plant, 26.iv.2012 (KM 756, 757); 1 female (microptera), the same place and plant, 29.iv.2012 (KM 764); Shiraz, 1 female, 1 male, the same place and plant, 14.vii.2012 (KM 876); Nurabad, 3 females, 3 males, from leaves of *Tamarix* sp., 4.vi.2012 (KM 844).

Liothrips setinodis (Reuter)

Phloeothrips setinodis Reuter, 1880: 310.

The only published record of this species from Iran is based on the synonymy by Bhatti *et al.* (2009) of *L. jakhontovi* Kreutzberg with *setinodis*. Kreutzberg (1955) described *jakhontovi* from Iran, and also from other areas where pistachio is grown including Turkmenia, and Afghanistan. In view of the association of *austriacus* with pistachio noted above, the validity of this synonymy remains in doubt. However, two females of *setinodis* have been studied from Iran (in SMF). These were collected from an unidentified plant in Assalam, Guilan Province, in 1970. Apart from this record, *setinodis* appears to be found mainly in northern Europe, with specimens in the collections at SMF from the following areas: Poland, Denmark, Scotland, England, France, Germany, Austria, Croatia, Italy and Spain.

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